

The Debate: Cochlear Implants in Children

Dramatic technological breakthrough, or destructive to the essence of Deafness?

**Dr. Mary Joe Osberger and Dr. Harlan Lane introduce
the first of our three part series...**

Children with Cochlear Implants Proven Winners

by Mary Joe Osberger, Ph.D.

Mary Joe Osberger received her M.S. in audiology from Gallaudet College and her Ph.D. in Speech and Hearing Sciences from the City University of New York. Since completing a postdoctoral fellowship, she was director of the Aural Rehabilitation Laboratory at the Boys Town National Institute in Omaha, NE, from 1980-1986 and a faculty member at the University of Wisconsin-Madison in the Department of Communicative Disorders from 1986-1988. Dr. Osberger is now a Professor and Director of Research in the Department of Otolaryngology at the Indiana



University School of Medicine. She has conducted and published numerous studies on the speech production and perception skills of children with profound hearing impairments. Her research for the past five years has focused on studying the benefits that children with profound hearing impairments derive from cochlear implants.

We are beginning our sixth year of evaluating the performance of children who use cochlear implants. Funded by the National Institutes of Health, our research examines the speech perception, speech production, language, and cognitive skills of these children before they receive an implant, while they are still using conventional hearing aids; and at six-month intervals after they have been implanted.

Ours is one of the largest study populations in the country of children who use the Nucleus multichannel cochlear implant. The children, all of whom have parents with normal hearing, range in age from about 2.5 to 18 years. Roughly half attend schools that employ oral communication, whereas the others are enrolled in public school programs which use total communication. All children are from environments which

Cochlear Implants Boon for Some--Bane for Others

by Dr. Harlan Lane

Harlan Lane received bachelor's and master's degrees from Columbia University in 1958, a doctoral degree in psychology from Harvard University two years later, and a state doctorate in linguistics from the Sorbonne in 1973. Dr. Lane is the author of numerous articles in professional journals concerning speech, hearing, and deafness, and of several books, among them *The Wild boy of Aveyron: Foundations of Special Education*; *When the Mind Hears: A History of the Deaf* and, published in 1992, *The Mask of Benevolence: Disabling the Deaf Community*.



His honorary awards include the Distinguished Service and Literary Achievement Awards of the National Association of the Deaf. He is currently a lecturer at Harvard Medical School, Research Associate at Massachusetts Institute of Technology, and Distinguished University Professor at Northeastern University.

There seems to be general agreement that cochlear implants are a boon to some hearing people who have lost their hearing and that they are inappropriate for members of Deaf culture who, in any event, generally do not want them. The thorny issues arise, as usual, in the gray area: deaf children who are likely one day to be members of Deaf culture but whose acculturation has not yet begun. Should we treat them like small hearing people who have lost their hearing, or should we treat them like small Deaf adults?

Close to 100 percent of adults with implants were fluent speakers of English before they were implanted, but less than five percent of children who are implant candidates are fluent in English. The other 95 percent of profoundly deaf children have not acquired a spoken

Part II will feature two parents, one deaf and one hearing, who will explore the decision-making process--and who is better qualified to decide what is best for a deaf child born to hearing parents. In **Part III** two psychologists, one deaf and one hearing, examine the psychological perspective and what factors should be considered before making a decision. Children who have had the implant will also be sharing their feelings about the device which has once again sparked an age-old controversy.

encourage the use of spoken communication and integration with people with normal hearing.

To appreciate the benefit that children gain from cochlear implants, it is necessary to keep in mind their performance with conventional hearing aids before they were implanted. These children received cochlear implants because they demonstrated essentially no auditory benefit from the most powerful hearing aids, unable to hear even very loud sounds, such as a car horn or a train whistle. They could benefit from an implant even if they only heard environmental sounds with it.

Our data, however, indicate that they perceive much more than environmental sounds with cochlear implants. In fact, recent results suggest that congenitally deafened

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children can acquire spoken language with a multichannel implant. Some of the major findings of the studies in our laboratory are summarized below:

1. All children detect sound at lower (better) levels with an implant than they did with conventional hearing aids.
2. Nearly all children, even teenagers, wear their implants all day long. They alert to and interpret sound in a meaningful way in the environment with their implants, which they did not do with their hearing aids.
3. Roughly three-fourths of the children are able to understand some words and sentences *without speechreading* with their implants.
4. Roughly half of the children are able to understand words or sentences *without speechreading* in an open set with their implants (i.e., the child has no responses from which to choose the answer).
5. Children who are unable to understand words or sentences *without speechreading* can at least perceive the prosodic or rhythmic aspects of speech with an implant (as well as environmental sounds) which they could not do with their hearing aids.
6. Nearly every child demonstrates improved speechreading performance with an implant over what they had demonstrated with hearing aids.
7. There are large individual differences among children in their performance with the multichannel implant. One of the most important

language and are likely to find baffling the distorted sounds emitted by an implant. Studies of implanted children show clearly that the tiny minority of late-deafened children far outperforms the majority who became deaf before they could master English. Thus, 60 *Minutes* prudently followed the lead of implant advocates on Capitol Hill in choosing star performer Caitlin Parton, who spoke English before losing her hearing, to illustrate communication with an implant (the program mistakenly claimed she was deafened before learning English).

I have reviewed recently the speech perception of children with cochlear implants in every published study with four or more patients, including several studies that appeared after my critique in *The Mask of Benevolence: Disabling the Deaf Community*. There are only some 10 studies in all; research on implants with children is in its infancy; these are highly experimental devices with very variable results and unknown long-term consequences physiologically, psychologically, linguistically and socially. Implanted children understand on the average between one and two spoken words out of ten; they are much worse at speech perception than profoundly deaf children using hearing aids. Of course, the average score depends on how easy the test is, but most of all it depends on how many children in the study already knew English before they became deaf. The early-deafened youngsters using their implants often score zero percent correct; a disproportionate number of late-deafened youngsters is usually included, with the result that the average creeps up misleadingly to 10 to 20 percent correct.

Enthusiasm for one's profession, admirable in itself, becomes dangerous when overzealous. A sure sign is overstating the client's need for the professional services and the client's benefit from receiving them.

"Deaf adults love Deaf kids; they know that most hearing parents make a botch of having a Deaf child..."

One way of overstating benefit is to recast the criteria for it, much as coaches use one set of records for the Special Olympics and a different set for the Olympics themselves.

In some of the research on children with cochlear implants, real-world criteria, such as how many words in ten they can understand have been replaced by newly invented measures, such as how many children can reach "level IV" or reach the "gold level." These top levels are then set low, for example, at "some speech perception" — that is, more than none. Lower levels are set

factors that explains differences between children is the length of time that they have used the implant. Often large improvements in performance are not documented on standardized tests until after the child has used the implant for one or two years. Children, who have used their device for more than three years are still showing signs of improvement.

8. Children with congenital deafness demonstrate as much benefit from an implant as do children with early acquired deafness (before age three).
9. All children who have been implanted with the multichannel implant have shown some improvement in their speech production skills. Children implanted at an early age (before age five or six) learn to produce consonant and vowel sounds with an implant that they could not do before with hearing aids. In fact, these children have learned to produce sounds which are often difficult for children with profound hearing impairments to produce (e.g., fricatives such as "s" and high vowels such as "ee").
10. Roughly half of the children have shown improvements in the intelligibility of their speech of 30% or greater. Intelligibility is measured by having the children imitate simple sentences, tape recording them, and then

lower yet: "can detect noise"; "is aware someone is speaking." Finally, it is shown that with enough professional intervention the child can be led from level I to level IV performance. The logical extension of this strategy is to pronounce every implanted child a star -- just what a banner at the last national conference on childhood implants proclaimed.

If totally deaf children are bound to suffer a miserable fate and any feeble echo of sound that may reach them is a humanitarian victory, then hail to the surgeons and their helpers who send the brain messages through wires. But suppose a healthy child, through some terrible error, had been confused with a sick child, an infirm child and underwent surgery and prolonged rehabilitation. Suppose that child had been in fact ready to bloom as a language learner, as an inquiring intellect, ready to blossom physically and psychologically. Clamor and clatter, a murmur, or even muffled voices would be poor recompense to that child for giving over much of childhood to audiology/speech-language pathology and adopting a disabled persona. If real communication is at one's fingertips, there is no reason to pay a high price for smoke signals.

Is it better to be raised as a hearing person without much hearing or as a Deaf person without hearing at all?

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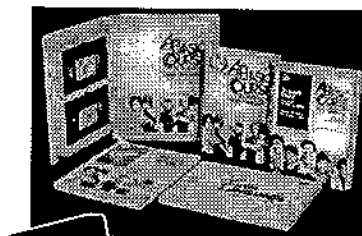
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playing the sentences to panels of listeners who are unfamiliar with the speech of talkers with impaired hearing. The listeners write down what they think the child has said. The percentage of words correctly understood is then calculated. Previous research has shown the average speech intelligibility of children with profound hearing impairments to be about 20%. The intelligibility of some children's speech has improved by as much as 50%.

11. Changes in speech production are observed within the first months after being

The answer is: It is better to be raised as a Deaf person without hearing at all. That is because, raised as a Deaf person, you can have a full-blown language; therefore, participate fully in a culture, and thus take pride in yourself and your heritage. Most members of the American Deaf community have tried both -- life as a hearing impaired person endeavoring to use oral communication, and life as an unimpaired Deaf person, fluently using American Sign Language. Those who have tried both almost always opt for embracing Deaf identity. That is why the National Association of the Deaf so vigorously opposes the zeal of the otologists and others in the movement to implant Deaf children.



Deaf people in North America and Europe whom I have asked generally say they are not disabled. "I disagree with that," otosurgeon Noel Cohen said on *60 Minutes*. "Our society is primarily a hearing society," he said, as one might say, "It's a hearing world," or "It's a man's world." These are remarks about the distribution of power. There is nothing inherently regrettable in being a culturally Deaf person or in having a Deaf child. Deaf parents know this, cherish who they are, and commonly rejoice when they have a Deaf child. A major reason for regret arises when hearing parents neglect their child by failing to communicate with him or her.

With a little effort -- much less than is required to become their child's speech therapist -- hearing parents can learn some sign language and make some friends in the Deaf community. If, instead, they choose an implant, and this leads them to settle for less than real substantive communication with their child, as it will for the majority, then it has done them and the child a terrible disservice.

If your natural attachment to the hearing environment in which you grew up prevents you from comprehending that Deaf is a legitimate way to be, that Deaf people's language and culture are as worthy as your own, then their insistence that they are not disabled and their opposition to surgical fixes is incomprehensible. This has led some to the foolish suggestion that Deaf people are opposed to implants because they fear the annihilation of their community. Deaf motives here are not so abstract or unworthy (and in any case implants will affect only a tiny percent of the nation's and the



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implanted, but children might not show improvements in speech intelligibility until they have used the implant for two or more years.

- 12.** Preliminary data suggest that changes in selected cognitive skills (e.g., attention) and spoken language occur after children are implanted. More research is needed to examine the complex relationship between language development and implant use, especially in children who use total communication.

Research has answered many questions about implants: A multichannel cochlear implant *can* help a child who received no benefit from hearing aids develop speech understanding and speech production skills.

Encouraging results have raised new questions and led to new directions in implant work with children. Given the high performance of children who were implanted at six or seven years of age, would it not be predicted that even higher levels of performance might be attained if they were implanted at the youngest age possible (i.e., two years according to the FDA guidelines)?

"Children... show large gains in speech understanding and speech production that would not have occurred with continued use of hearing aids."

Speech and language skills will develop faster with access to spoken language during the first few years of life, rather than waiting until the child is five or six. Of course, this requires that tests be developed to assess speech perception skills and hearing aid benefit in very young children. As these procedures become available, there will be an increasing number of children who are implanted at an early age.

Children who have been implanted with the multichannel device show large gains in speech understanding and speech production that would not have occurred with continued use of hearing aids. The number of children who can benefit from these devices will increase as cochlear prostheses are further developed and improved. No other sensory aid has had such a dramatic impact on improving the acquisition and use of spoken language by children with profound hearing impairments.

**Don't miss Part II of The Debate
WHOSE CHILD IS THIS?**

Rick Abicella, Esq. & Dr. Larry Folscher will present
two parents' perspectives on cochlear implants.
Coming in the April/May issue of hearing health.

world's Deaf peoples). Deaf adults love Deaf kids; they know that most hearing parents make a botch of having a Deaf child -- frequently they had hearing parents themselves. They want to spare Deaf children going through the needless suffering that they endured. They realize

"The essentials of the cochlear implant debate have been disputed unchanged for over four centuries."

that the key to success is acceptance and that implant surgery, prosthetic devices, speech therapy and oral communication are the dramatic opposite of accepting Deafness. Consider: there are many prostheses from eyeglasses and artificial limbs to cochlear implants. Can you name another that we insist on for children in flagrant disregard of the advice of adults with the same "condition?"

The essentials of the cochlear implant debate have been disputed unchanged for over four centuries. On the one hand are the oralists who claim that they can enable the hearing impaired child to communicate orally with enough professional intervention, devices and participation by the school and the parents. On the other hand are the manualists who claim that growing up Deaf does not involve disability if the child is given access to manual language; they assert that oralism generally fails and the Deaf child pays a high price for the attempt.

There are two new elements introduced in the dispute in the last decades. Surgery is the most extreme intervention that oralism has yet brought to bear on Deaf children. And there is now compelling scholarly evidence that the Deaf community of the United States is one of our indigenous linguistic and cultural minorities.

I believe the debate will long outlive us, for it is fundamentally about our tolerance for human diversity, and there will always be individuals and professions that urge efforts at normalizing and others, including the group concerned, that insist on the legitimacy of their difference and the dangers of self-denial.

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